To the contrary, Allgulin discloses, column 3, line 6, *et seq.*, that ... the impurities in question are precipitated ..., there is formed in the aqueous solution a hydroxide precipitate which contains the impurities and which can be substantially completely separated from the solution.

Allgulin not only discloses, but also suggests that once metal ions are added to the solution, a *complete precipitate* of the impurities including phosphorus is formed and can be removed. As such, there is no suggestion that an inorganic anionic colloid and/or flocculant are required to precipitate the impurities. Implying that addition of the inorganic colloid, or flocculant, or both, disclosed in Chung et al is required is incorrect because there is nothing further in Allgulin to be precipitated because *complete precipitate* is formed.

In other words, the combined disclosure does not suggest the claimed invention.

In fact, Chung et al is not an analogous art for it is not related to applicant's endeavor and is not pertinent to the problem with which applicant was concerned. A nonanalogous art cannot be combined with a primary reference for a 103(a) rejection.

Even if they can be combined, Chung et al discloses adding an anionic colloid and/or a flocculant to a wastewater without disclosing or suggesting the adjustment of pH of a wastewater. That is, there is still no nexus between Allgulin and Chung et al. In fact, Allgulin already shows that once pH is adjusted, by addition of the metal ions, the impurities precipitate. There is no need to add any inorganic colloid and/or flocculant. Applicant sees no suggestion in Chung et al that there is a need to add an inorganic colloid and/or flocculant to a solution where there is nothing to be precipitated.

Finally, the claimed invention requires the addition of elements (c) and (d) discussed above to produce a flocculated mass. Before addition of elements (c) and (d), there is little or no reduction in phosphorus and COD content. This is shown in runs 1 and 2 (pH adjustment to 9.7 with CaO) and run 3 (pH adjusted to 9.7 followed by addition of Zn ions) of the accompanying Rule 132 declaration. Unexpectedly, addition of elements (c) and (d) significantly reduced both P and COD. Such synergistic effect is not suggested in the references.

Claims 2-4, 6-14, and 25-33 were rejected under 35 USC 103(a) over Allgulin in view of Chung et al and further in view of Laurent et al. The rejection is also traversed.

The argument for traversing the rejection over Allgulin and Chung et al discussed above showing there is no suggestion for deriving claims 1, 3-5, 7-14, and 23-24 is incorporated here. As discussed above, combining Allgulin and Chung et al does not suggest claims 1, 3-5, 7-14, and 23-24. Claims 2-4, 6-14, and 25-33 are dependent claims of claims 1 or 5 and are therefore unobvious over Allguin and Chung et al. The question is whether Laurent et al suggests the teaching missing in Allgulin and Chung et al.

Laurent et al discloses, as acknowledged by the examiner, recovery of contaminants from waste streams using natural flocculents and use the recovered flocculated waste for animal feed. However, Laurent et al does not cure the lack of suggestion in the combined Allgulin and Chung et al because it does not suggest the teaching missing in Allgulin and Chung et al, i.e., the need to add an inorganic colloid and/or flocculant. Whether Laurent et al discloses the used of recovered waste is immaterial to the claimed invention.

Claims 15-16, 19, 22-24, and 34 were rejected under 35 USC 103(a) over Ayukawa in view of Monick et al. The rejection is also traversed.

Ayukawa discloses purification of waste water comprising coagulating and precipitating suspended substances and colloidal dispersed particles, and precipitating non-colloidal dissolved, low molecular weight, substances by adding an aqueous solution of $ZrOCl_2 \cdot 8H_2O$ to the waste water, adjusting the pH to 4.5-6.8 to form water insoluble precipitates or chelates thereof and removing the precipitates and chelates. *See* Abstract and where the examiner cited, especially column 3, lines 54-64. Ayukawa disclosure not only precipitates or chelates low molecular weight non-colloidal substance, but also precipitates or chelates colloidal dispersed particles. *See also* column 1, line 64 to column 2, line 2; column 2, lines 8-14; *et seq.*

Ayukawa disclosure, precipitating and flocculating a colloidal substance by a zirconium salt, is therefore contrary to the claimed invention, which recites adding one or more metal ions selected from the group consisting of titanium and zirconium,

a flocculant to the stream (claim 15), and a colloid (claim 22) to produce a flocculated mass.

If Ayukawa provides motivation to derive the claimed invention, as the examiner asserted, the inorganic colloid recited in the claimed invention would or should be precipitated by Zr or Ti metal ions (because Ayukawa discloses precipitating colloids with metal ions). Addition of metal ions and inorganic colloids to a waste water therefore does not make sense. That is, no reasonable person would, in view of Ayukawa disclosure, combine Zr metal ions and inorganic colloids together. Ayukawa disclosure therefore leads one skilled in the art away from the claimed invention which requires the addition of the metal ions and the colloids. The Ayukawa disclosure also shows that the invention is surprising.

The present application shows that, without the addition of Ti (Table 9; page 20) or Zr (Table 10; page 21) ions, addition of anionic colloid (SiO_2) and cationic polyacrylamide (flocculant) reduced little (Table 10) or less than 50% (able 9) of phosphorus present in the wastewater.

The accompanying declaration also shows merely adjusting pH with an acid followed by addition of Ti or Zr did not appreciably reduce the P concentration or COD. Addition of an anionic colloid and/or a flocculant following the pH adjustment (runs 6 and 9) as recited in the claimed invention significantly reduced the P concentration and COD.

These results demonstrate synergistic effect of combining pH adjustment, Zr or Ti metal ions, and an inorganic colloid and/or polymer flocculant. Ayukawa disclosure does not suggest the synergism.

The question is then whether Monick et al suggests such synergism.

Monick et al discloses a treatment composition for removing heavy metals from wastewater using activated montmorillonite; bentonite; one or more flocculants; an alkali metal or alkaline earth metal carbonate; and a catalyst comprising zirconium and at least one polyelectrolyte. See, e.g., column 2, lines 16-22.

A catalyst is known to one skill in the art as a substance that by its mere presence alters the velocity of a reaction and it itself may be recovered unaltered and in the same amount at the end of the reaction. The Monick et al composition

comprising zirconium as catalyst indicates that zirconium is not a reactant. That is, where a flocculant is present, zirconium cannot be used as precipitant or flocculant.

It is now clear, the zirconium disclosed in Ayukawa combines with the contaminates to cause precipitation and flocculation. To the contrary, the zirconium described in Monick et al is a catalyst that by definition does not combine with contaminates causing precipitation and flocculation.

The disclosures of Monick et al and Ayukawa are therefore contradictory to each other and suggest that these two references cannot be combined. Even if they could arguably be combined, the combined disclosure does not suggest the synergism discussed above.

Claims 17-18, 20-22, and 35-40 were rejected under 35 USC 103(a) over Ayukawa in view of Monick et al and further in view of Laurent et al. The rejection is also traversed.

The argument for traversing the rejection over Ayukawa and Monick et al as discussed above is incorporated here. The discussion of Laurent et al in traversing the rejection of claims 2-4, 6-14, and 25-33 is also incorporated herein.

From these discussions, Ayukawa and Monick et al cannot be combined, i.e., no *prima facie* case of obviousness is established. Even if they could be combined, Laurent et al does not suggest the synergism, the teaching missing in the combined disclosure of Ayukawa and Monick et al. Accordingly, combining Ayukawa, Monick et al, and Laurent et al does not suggest the claimed invention.

Respectfully submitted,

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APPENDIX

26. (amended) The process of claim 25 wherein said process ~~consisting~~ consists essentially of adjusting the pH of an aqueous stream, which comprises phosphorus, to at least 7 by adding a calcium-containing compound; adding one or more metal ions selected from the group consisting of zinc ions, manganese ions, and mixtures thereof to the stream; and adding an anionic inorganic colloid to the stream; and adding a flocculant to produce a flocculated mass.

27. (amended) The process of claim 25 wherein said process ~~consisting~~ consists essentially of adjusting the pH of an aqueous stream, which comprises phosphorus, to at least 7 by adding a calcium-containing compound; adding one or more metal ions selected from the group consisting of zinc ions, manganese ions, and mixtures thereof to the stream; adding at least one cationic organic polymer to the stream; and adding at least one anionic organic polymer to the stream to produce a flocculated mass.

28. (amended) The process of claim 25 wherein said process ~~consisting~~ consists essentially of adjusting the pH of an aqueous stream, which comprises phosphorus, to at least 7 by adding a calcium-containing compound; adding one or more metal ions selected from the group consisting of zinc ions, manganese ions, and mixtures thereof to the stream; adding a flocculant to the stream to produce a flocculated mass; recovering the flocculated mass; and using the recovered the flocculated mass as a nutrient source or animal feed.

31. (amended) The process of claim 27 wherein said process ~~consisting~~ consists essentially of adjusting the pH of an aqueous stream, which comprises phosphorus, to at least 7 by adding a calcium-containing compound; adding one or more metal ions selected from the group consisting of zinc ions, manganese ions, and mixtures thereof to the stream; adding at least one cationic organic polymer to the stream; adding an anionic inorganic colloid to the stream; and adding at least one anionic organic polymer to the stream to produce a flocculated mass.

32. (amended) The process ~~according to~~ of claim 28 wherein said process ~~consisting~~ consists essentially of adjusting the pH of an aqueous stream, which comprises phosphorus, to at least 7 by adding a calcium-containing compound; adding one or more metal ions selected from the group consisting of zinc ions,

manganese ions, and mixtures thereof to the stream; adding an anionic inorganic colloid to the stream; adding a flocculant to the stream to produce a flocculated mass; recovering the flocculated mass; and using the recovered the flocculated mass as a nutrient source or animal feed.